



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Arana et al.

Serial No: 09/923,139

Group No.: 3700

Filed: August 6, 2001

Examiner:

For: THERMALLY EFFICIENT MICRO-FLUIDIC SYSTEM

Commissioner for Patents  
Washington, DC 20231

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INFORMATION DISC. STATEMENT; PTO FORM 1449 AND COPIES OF REFS. CITED-ATTACHED

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PATENT  
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of  
Arana et al.

THERMALLY EFFICIENT  
MICRO-FLUIDIC SYSTEM

Art Unit 3743

Serial No.: 09/923,139

Filed: August 6, 2001

INFORMATION DISCLOSURE STATEMENT

Pittsburgh, Pennsylvania 15222

November 6, 2001

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C. 20231

Sir:

Applicants, in accordance with their duty of disclosure pursuant to 37 C.F.R. § 1.56, hereby advise the United States Patent and Trademark Office of the reference(s) listed on the accompanying form PTO 1449 "Information Disclosure Statement By Applicant." A copy of each reference cited therein is herewith enclosed.

This Information Disclosure Statement ("IDS") is being submitted in connection with the above-identified application.

The WO 99/44376 reference, the text of which is provided in German, is entitled, "Method For Carrying Out Chemical Reactions In A Microreactor, And Such A Microreactor." Microreactors are especially characterized by a high selectivity and yield of the chemical


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reactions carried out therein. The large surface to volume relationship, however, also leads to large heat losses from the reaction area to the surrounding area during counter flow feeding of the educt and product streams, whereby the use of these microreactors is limited when carrying out chemical reactions at high temperatures. The aim of the invention is to minimize these heat losses. To this end, the method provides that the educt and production streams are fed in a spiral-like or radial manner to or from the reaction area (4) arranged in a central area of the microreactor (1). In at least one plane, the reaction area (4) is surrounded by the educt and product streams, said streams being guided toward one another in the counter stream, such that the yielded reaction heat is, to a large extent, fed to the reaction area again. As a result, the area of application of the microreactors is decisively expanded with regard to reactions carried out at high temperatures. The invention also relates to a corresponding microreactor in various designs.

Applicants believe that the instant IDS fully complies with the disclosure requirements of 37 C.F.R. §§ 1.56, 1.97 and 1.98, inasmuch as under rule 37 C.F.R. § 1.98 there is no requirement for Applicants to explain the relevance of the English language references cited in the IDS.

Applicants note that although the cited references may be relevant to the examination of the above-referenced application, under 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement "shall not be construed to be an admission that the information cited in the statement is, or is considered to be, material to patentability as defined in § 1.56(b)."

Respectfully submitted,

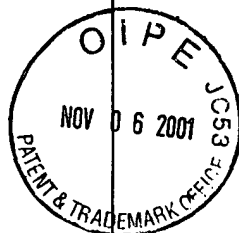
A handwritten signature in dark ink, appearing to read "Mark R. Leslie", written over a horizontal line.

Mark R. Leslie  
Registration No. 36,360  
Attorney for Applicant

Kirkpatrick & Lockhart LLP  
Henry W. Oliver Building  
535 Smithfield Street  
Pittsburgh, PA 15222-2312

Phone: (412) 355-6271  
Fax: (412) 355-6501

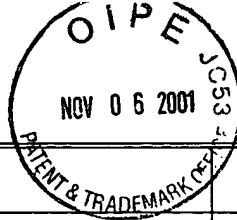
<p>Form PTO-1449</p> <p>U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE</p> <p>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</p> <p>(Use several sheets if necessary)</p>	<p>Atty. Docket No. 010400</p> <p>Applicants: Leonel R. Arana Aleksander J. Franz Klavs F. Jensen Samuel B. Schaevitz Martin A. Schmidt</p>	<p>Serial No.</p> <p>Group</p>
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## U. S. PATENT DOCUMENTS

Examiner Initial	Document Number	Issue Date	Patentee	Class	Sub-Class	Filing Date
	4,386,505	June 7, 1983	Little			
	4,516,632	May 14, 1985	Swift et al.			
	4,614,119	September 30, 1986	Zavracky et al.			
	4,908,112	March 13, 1990	Pace			
	5,021,663	June 4, 1991	Hornbeck			
	5,094,906	March 10, 1992	Witzke et al.			
	5,209,906	May 11, 1993	Watkins et al.			
	5,385,709	January 31, 1995	Wise et al.			
	5,458,191	October 17, 1995	Chiang et al.			
	5,534,328	July 9, 1996	Ashmead et al.			
	5,589,136	December 31, 1996	Northrup et al.			
	5,595,712	January 21, 1997	Harbster et al.			
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	5,646,039	July 8, 1997	Northrup et al.			
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Examiner Initial	Document Number	Issue Date	Patentee	Class	Sub-Class	Filing Date
	5,789,753	August 4, 1998	Gooch et al.			
	5,811,062	September 22, 1998	Wegeng et al.			
	5,843,385	December 1, 1998	Dugan			
	5,863,502	January 26, 1999	Southgate et al.			
	5,882,496	March 16, 1999	Northrup et al.			
	5,932,315	August 3, 1999	Lum et al.			
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	5,965,237	October 12, 1999	Bruin et al.			
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	6,250,379	June 26, 2001	Geissler et al.			

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FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

Examiner Initial	Document Number	Public. Date	Country or Patent Office	Class	Sub-Class	Transl Y N
	WO 99/44736	September 10, 1999	EPO			



## OTHER DOCUMENTS

(Including Author, Title, Date, Relevant Pages, Place of Publication)

		Leboutitz, K.S., MEMS Microshells for Microneedles, Microscale Fluid Visualization, and Vacuum Packaging of Microdevices (A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in Engineering – Mechanical Engineering), Chapter 3, pp. 40-55, Fall 1998, University of California, Berkeley (USA).
		Wegeng et al., Developing New Miniature Energy Systems, Mechanical Engineering, vol. 116, No. 9, pp 82-85, September 1994.
		Mehra et al., Development of a Hydrogen Combustor for a Microfabricated Gas Turbine Engine, presented at Solid-State Sensor and Actuator Workshop, Hilton Head Island, South Carolina, June 8-11, 1998.
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.		

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